

RESEARCH ARTICLE

Associations of Self-rated Health and Socioeconomic Status with Information Seeking and Avoiding Behavior among Post-Treatment Cancer Patients

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Abstract

This study investigated how self-rated health and socioeconomic status are associated with behaviour of cancer survivors regarding desire for information. For this association, we compared survivors who did not seek information about cancer with those who did. We examined how sociodemographic, socioeconomic, cancer-related, and health information factors are associated with self-rated health (SRH) by health information seeking/avoiding behavior in a survey of 502 post-treatment cancer patients. In the information seeking group, all four factors exhibited significant relationships with SRH. SRH values were significantly high for women ($p < 0.05$), non-Hispanic White ($p < 0.05$), and educated ($p < 0.01$) participants, and for those who had high self-efficacy to use health information by themselves ($p < 0.01$). Furthermore, in the information avoiding group, not only were there no significant relationships between socioeconomic status (SES) and SRH, but there were negative associations between their attitude/capacity and the SRH. In terms of communication equity, the promotion of information seeking behavior can be an effective way to reduce health disparities that are caused by social inequalities. Information avoiding behavior, however, does not exhibit a negative contribution toward the relationship between SRH and SES. Information seeking behavior was positively associated with SRH, but avoiding behavior was not negatively associated. We thus need to eliminate communication inequalities using health intervention to support information seeking behavior, while simultaneously providing support for avoiders.

Keywords: Health information seeking - health information avoidance - self-rated health - health communication

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Introduction

Cancer is the second leading cause of death by disease-1 of every 4 deaths-in the United States, exceeded only by heart disease. This year, an estimated 577,190 are expected to die of cancer, more than 1,500 people a day, and about 1,638,910 new cancer cases are expected to be newly diagnosed (ACS, 2012). However, the overall cancer death rate has steadily declined since the early 1990s, and the 5-year survival rate is now 67%, up from 49% in the 1970s (ACS, 2012). As a result, there are now nearly 12 million cancer survivors in the US.

Cancer survivorship, with the goal of increasing the overall health level of cancer survivors and helping them return to society, is a national issue (CDC, 2013). Since complex factors are involved in the health status of post-treatment cancer patients, usually the health-related quality of life or self-rated health (SRH) is studied (Richardson et al., 2008). Considering that cancer survivors' SRH is related not only to their treatment outcome or prognosis, but also to microscopic factors, including socioeconomic determinants (Richardson et al., 2008; Underwood et al., 2012), it is necessary to understand their health disparities.

As cancer survivors and patients search for a wide range of health information to help them continue with their lives after treatment, a new research field has developed to examine the disparities from a health communication perspective (Galarce et al., 2011).

Communication inequality is likely to exist in terms of availability and accessibility (Jung, 2013). Highly educated people with more access to a variety of resources have better chances to use and interpret information than the less highly educated. It has been claimed that this information gap has been narrowed with the advancement of mass media and the Internet (Shim, 2008). However, the ability to pick the right information and select the correct knowledge from conflicting data varies among patients, and this variation may be closely related to social class (Ramanadhan and Viswanath, 2006; Kav et al., 2012; Jung, 2013). Little research has been conducted on health disparity among cancer survivors in terms of social and communication inequality. Research on communication inequality has developed through studies on information-seeking/avoiding behaviors.

Health information-seeking behavior (HISB) describe the actions of patients collecting the information necessary

for their health, as the patients try to address their stress or disease problems (Galarace et al., 2011). HISBs emerged when the importance of the shared-decision making model in patient-physician communication increased due to scientific advances in oncology (Committee on Quality of Health Care in America, 2001; Davison et al., 2002). Because informed patients actively interact with their medical providers to achieve the desired health outcome and manage their symptoms for themselves (Kahn et al., 2007), they are a desirable patient group for today's changing medical environment.

The same can be said of health information-avoidance behaviors (HIABs); under threatening health situations, people can react by denying and avoiding them, rather than acting on them. For example, cancerous patients tend to do nothing about their disease, mainly because they are scared and in despair (Rees and Bath, 2001; Case et al., 2005). People in this group usually do not have an intention to search for information, because doing so would be an acknowledgement of their disease. That is why the behaviors of HIABs have been analyzed with the psychological mechanism (Rees and Bath, 2001; Case et al., 2005). However, information avoiders sometimes think that information is too confusing to be useful (Brashers et al., 2000), or intentionally avoid it because of their physician-patient relationships (Czaja et al., 2003). The reasons for avoidance are varied, but they have the same consequence of resulting in a lack of necessary information, and potential health disparities (Ramanadhan and Viswanath, 2006; McCloud et al., 2013).

Cancer-related health information can help strengthen the patient's coping capacity (Huber and Cruz, 2000; Jung et al., 2013), boost his/her self-efficacy (Lee et al., 2008), and encourage an active engagement in the course of the relevant medical decision making process (Czaja et al., 2003). It can also alleviate the uncertainty and anxiety felt by patients due to the treatment (Stark and House, 2000), and let them expect a better prognosis. In fact, patients equipped with information experience fewer side effects and show better social and cognitive functioning (Schou et al., 2005). Additionally, many studies have found that HISBs are related to the patients' cancer screening, reducing unhealthy behaviors, and treatment compliance (Czaja et al., 2003; Shi et al., 2004; Rutten et al., 2005; 2006).

However, the conscious awareness of HISBs and HIABs about the need for the correct information can be affected by the patient's psychological factors as well as social context. Especially in terms of communication inequality, the socioeconomic status (SES) could produce that difference (Galarace et al., 2011). The facts that less educated people or those with low incomes are likely to be non-seekers (Ramanadhan and Viswanath, 2006), and that the types of information sought vary according to SES (Galarace et al., 2011; McCloud et al., 2013) show that more attention needs to be focused on this issue. Given the wide acceptance that health status is unequal due to social class, and that a health-related gap exists between information seekers and information avoiders, negligence on this issue will further widen that disparity. Thus, this problem needs to be investigated with a model

that contains all of these three factors.

Many issues regarding HISBs and HIABs remain unaddressed. Particularly, few studies have directly compared the two within one sample due to difficulties in collecting data for a systematic comparison. Moreover, seeking and avoiding behaviors can change over the illness trajectory (McCaughan and McKenna, 2007; Ehemann et al., 2009; Jung et al., 2013), as well as disease related factors (Mayer et al., 2007; Nagler et al., 2010; Smith-McLallen et al., 2011). Therefore, this study on HISBs and HIABs promises to provide useful material for comparing the two categories.

With the increasing attention on the social determinants that create various behaviors, such as collecting or making use of health-related knowledge, or failing to process or remaining irresponsive to it, a model called the structural influence model (SIM) has been designed to explain how an individual's health communication behaviors influence the varied health outcomes (Ramanadhan and Viswanath, 2006; Jung, 2013; McCloud et al., 2013). This framework is an effective tool to show differences between HISBs and HIABs, which mediate or moderate health outcomes on the basis of health disparities (Kontos et al., 2007; Viswanath et al., 2007; McCloud et al., 2013). This study does not intend to methodologically demonstrate SIM, but rather uses this tool as an organizing framework to produce research questions and interpret the results.

SES difference included income (Ramanadhan and Viswanath, 2006), education (Rutten et al., 2006; Mayer et al., 2007; Duggan and Bates, 2008), and ethnic/racial groups (Levinson et al., 2005; Rutten et al., 2006; Mayer et al., 2007) in the HISB group. Sociodemographic antecedents (SDA) such as gender and age are important, with men and younger-age subjects more likely to engage in information seeking behavior than women and older subjects (Rutten et al., 2006; Mayer et al., 2007; Vanderpool et al., 2009; Viswanath et al., 2013; Wang et al., 2013). However, compared to HISBs, not much is known about HIABs, and more scientific evidence is needed to verify the complex relationship between the factors within the SIM framework. In order to link a macro-social factor like SES with health outcomes through HISBs and HIABs, we need to examine various information-related conditional factors such as attitude toward health information, capacity to use it, and family support that affect the individual in deciding on a given behavior. This study focused on the relationships between SRH and SES by HISBs and HIABs among cancer survivors (Figure 1). We compared how the SES-SRH relationship differs in the HISBs and HIABs groups, with the related-factors controlled for. Through this, we sought to elucidate the state of communication inequalities among cancer patients and to gain insights needed for formulating a policy to mitigate these inequalities and improve disease prognosis.

Materials and Methods

Respondents

The study participants were recruited using a database of current/former patients at a major cancer hospital in

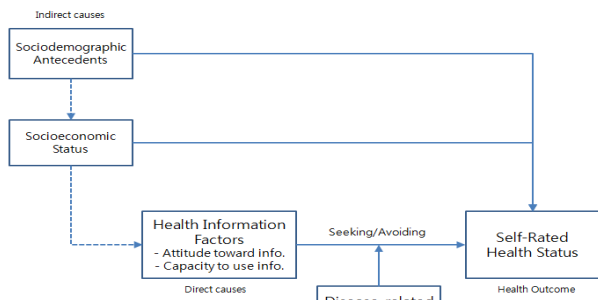
Independent variables

Figure 1. The Structural Influencing Model of this Study. *The dotted lines are based on related theories; the unbroken lines indicate the results of this study

the U.S. Respondents were eligible to participate if they had been diagnosed with cancer within the previous 5 years, had not undergone any treatment (radiation and/or chemotherapy) in the previous 5 years, had no evidence of metastatic disease or tumor recurrence, and spoke English or Spanish.

Data collection

We selected a random sample of 1,000 participants who met the eligibility criteria, including all patients with low SES and ethnic minority groups. Each individual's physician was sent an email describing the study and notifying him/her of our intent to contact the participant in the study. Except in the cases that requested not to do so by the physician, we mailed a copy of the questionnaire to each respondent's home, with opportunities to respond by mail, via internet, or over the phone. The packet also included a pre-paid, pre-addressed postcard and a \$5 gift card as a token of appreciation. The final sample consisted of 521 participants for a response rate of 52.1%. Sampling and recruitment procedures complied with HIPAA standards and were approved by the Institutional Review Board of the Cancer Center.

Measures

The survey instrument was developed from a literature review and through focus group discussions aimed at examining information-seeking behaviors among 6 groups with 44 post-treatment cancer patients and caregivers in Boston, Massachusetts. The survey questions were developed based on a qualitative analysis of these groups' responses, which included items on cancer information-related behaviors, desired information issues, barriers to information access, and health and functional status.

Dependent variables: SRH status

Our dependent variable was SRH status ('In general, what would you say your health is'). It was measured with a Likert's type 5-point scale ranging from 'excellent' (score 1) to 'poor' (score 5). We, however, recoded the responses as a 3-point scale in order to satisfy the assumption of a normal distribution. Although this simple health rating is far from being able to capture the various dimensions of health status among cancer survivors, it has been reported to reliably predict survivors in populations even after considering for known health risk factors (Jung and Viswanath, 2013).

SES was identified according to education, income, and debt, along the constructs of the SIM framework. For education, the respondents were asked to identify their highest level of education completed: Less than High School; High School/GED, or Associate Degree; College Degree, Post Graduate Degree. For income, the respondents were asked about their total household income before taxes: Under \$29,999; \$30,000-\$49,999; \$50,000-\$74,999; \$75,000 or above; Don't know; and Refused. For debt, the respondents were asked about their level of debt, excluding car loans and home mortgage: Less than \$2,000; \$2,000-\$4,999; \$5,000-\$9,999; \$10,000-\$19,999; \$20,000-\$49,999; and \$50,000 or more; Don't know; and Refused.

Three sociodemographic characteristics were also measured: gender, age, race/ethnicity. Age was modeled as a continuous variable. Ethnicity/race was assessed following the Office Management and Budget standards. The ethnicity item asked respondents whether they identified themselves as Hispanic or Latino; the race item asked them about their self-identified race. Responses to these items were combined to create the following four categories: non-Hispanic White; Hispanic; Black/African American; Asian; or Other. The Other category included American Indians, Native Hawaiians or Pacific Islanders, and individuals who reported multiple races but not Hispanic ethnicity.

Regarding health information-related factors, we asked a series of questions about health information-related factors such as a patient's attitude toward information, own capacity to use information, and families' support. Attitude was assessed in terms of information confidence measured by a five-point scale ('completely confident' to 'not confident at all') and information helpfulness was measured by a four-point scale ('strongly agree' to 'strongly disagree'). Capacity was assessed in aspects of access and utilization that had drawn factor analysis. We asked nine questions about the barriers to finding or obtaining the desired information about the patient's cancer, using a three-point ordinal scale, which was collapsed into a single factor for utilization capacity (Cronbach's alpha=0.826), as well as another for access capacity (Cronbach's alpha=0.932). Regarding other conditional factors, we asked the patients whether they had gotten a second opinion when they were diagnosed with cancer or not and whether any family members looked for information about cancer.

Cancer-related factors were assessed by the following three items. First, cancer types were identified as prostate cancer, lung cancer, leukemia or blood cancer, head and neck cancer, colon or rectal cancer, and breast cancer, or other. Second, the respondents then identified the length of illness from the year at first diagnosis: Under 2 years, 3 years, 4 years, and 5 years or over. Third, the health insurance status was set in the following categories: Private insurance; Medicare; Medicaid; or Others.

Mediating variables

HISBs and HIABs were assessed through asking "Since you were diagnosed, was there ever a time when

you purposefully avoided information about cancer?" with response options of yes or no. For this variable, we separated all the respondents into two mutually exclusive groups: if yes, then the avoidance groups; if no, the seeking groups. This categorization was possible because all the information non-avoiders had an experience of looking for cancer-related information, except eleven respondents who did not answer coherently and were excluded from the study analysis. Eight missing values were also excluded using a pairwise method, leaving 502 study participants for the final analyses.

Statistical analysis

The frequency and percentage of the 502 participants were run for all general characteristics of the samples. Different characteristics in the information-seeking/avoiding groups were identified using chi-square statistics. In order to categorize the information capacity related variables, structural items were subjected to principal component analysis with a promax oblique rotation. Ordered logistic regression analyses were used to analyze the relationships between SRH status and independent factors (SDA, SES, cancer-related factors, and information-related factors) according to the HISBs and HIABs among cancer survivors. Race and cancer type variables were modeled as a dummy variable in the information-avoider model, due to its sample size.

Results

General sample characteristics

Of the 502 respondents, 73% were women and 27% men (Table 1), while 29% were in their 50s and 9% were over 70 years of age. For race/ethnicity, the dominant participants were non-Hispanic White at 82%. Regarding education, a majority of the respondents (57%) had a college degree or higher. Regarding income, 55% of the respondents earned over \$75,000 per year, while 29% had a debt of less than \$2,000. Breast cancer was the most common cancer, with 46% (64% of the females) participants. Regarding the length of illness, 26% had suffered for less than 2 years. Most participants (77%) had their own private health insurance.

Bivariate analyses: The major difference between the information-seeking/avoiding groups

As shown in Table 2, with respect to SDA, compared to seekers, avoiders had more females (p<0.05) and people younger than 49 (p<0.001). Regarding SES, avoiders had relatively greater debt compared to seekers (p<0.05), and, although marginally significant, were about three times more likely to be in the low-income segment with less than \$30,000 (p<0.1). There was no particular difference between the two groups in terms of cancer-related factors. However, in the case of health insurance type, avoiders had slightly more private insurance compared to seekers (p<0.1).

Examination of the differences between the two groups regarding health information-related factors showed a difference mostly in terms of the attitude toward information (Table 3). Information confidence was

Table 1. General Sample Characteristics (n=502)

	%	n		%	n
Gender			Education		
Men	26.7	134	High school or less	13.9	70
Women	72.9	366	High school to associate	28.1	141
Missing	0.4	2	College	28.3	142
			Post-graduate	29.1	146
Age			Missing	0.6	3
≤39	10.4	52	Income		
40-49	23.7	119	≤\$29,999	11	55
50-59	28.7	144	\$30,000-\$49,999	8	40
60-69	26.7	134	\$50,000-\$74,999	14.7	74
≥70	9.4	47	≥\$75,000	54.8	275
Missing	1.2	6	Missing	11.6	58
Race			Debt		
Non-Hispanic White	81.5	409	≤\$1,999	28.7	144
Hispanic	5.2	26	\$2,000-\$4,999	10.4	52
Black/African American	7.4	37	\$5,000-\$9,999	9.2	46
Asian	3.2	16	\$10,000-\$19,999	9.4	47
Other	1.2	6	\$20,000-\$49,999	9	45
Missing	1.6	8	≥\$50,000	14.5	73
Health Insurance			Missing	18.9	95
Private Insurance	76.5	384	Cancer Type		
Medicare/Medicaid	19.9	100	Breast Cancer	46.4	233
Missing	3.6	18	Colon or Rectal Cancer	5	25
Length of Illness			Head and Neck Cancer	3.8	19
Under 2 yrs	26.1	131	Leukemia or Blood Cancer	3.2	16
3 yrs	23.1	116	Lung Cancer	4.4	22
4 yrs	25.7	129	Prostate Cancer	4.2	21
Over 5 yrs	20.1	101	Other	33.1	166
Missing	5	25	Missing	0	0

Table 2. Bivariate Analyses of the Sample by Information-Seeking/Avoiding Groups

Variables		Seeker (n=326)%	Avoider (n=176)%	X ² p value
Gender	Men	29.6	21.6	3.8
	Women	70.4	78.4	<0.05
Age	≤39	6.5	17.7	24.3
	40-49	22.1	27.4	<0.001
	50-59	29	29.1	
	60-69	30.6	20.6	
	≥70	11.8	5.1	
Race	Non-Hispanic White	81.6	85	1.8
	Hispanic	5.6	4.6	n.s.
	Black/African American	7.5	7.5	
	Asian/Other	5.3	2.9	
Education	High school or less	15.8	10.8	3.3
	High school to associate	28.8	27.3	n.s.
	College	26.6	31.8	
	Post-graduate	28.8	30.1	
Income	≤\$29,999	11.9	31.2	6.4
	\$30,000-\$49,999	10.9	5.7	<0.1
	\$50,000-\$74,999	18.6	13.2	
	≥\$75,000	58.6	67.9	
Debt	≤\$1,999	41.2	25.7	11.9
	\$2,000-\$4,999	12.2	13.8	<0.05
	\$5,000-\$9,999	10.2	13.2	
	\$10,000-\$19,999	9.8	14.5	
	\$20,000-\$49,999	11.4	10.5	
	≥\$50,000	15.3	22.4	
Cancer Type	Breast Cancer	44.8	49.4	10.4
	Colon or Rectal Cancer	4.9	5.1	<0.1
	Head and Neck Cancer	4.6	2.3	
	Leukemia or Blood Cancer	3.1	3.4	
	Lung Cancer	3.4	6.3	
	Prostate Cancer	5.8	1.1	
	Other	33.4	32.4	
Health Insurance	Private insurance	77.1	83.4	2.7
	Medicare/Medicaid	22.9	16.6	<0.1
Length of Illness	Under 2 yrs	27.8	26.9	1
	3 yrs	25.5	22.2	n.s.
	4 yrs	26.5	28.1	
	Over 5 yrs	20.3	22.8	
Self-Rated Health Status	Excellent/Very good	59.7	59.2	1.2
	Good	27.5	24.7	n.s.
	Fair/Poor	12.8	16.1	

*n.s.- not significant

significantly lower in avoiders than in seekers ($p<0.01$), and information helpfulness was also perceived to be relatively not useful in this group ($p<0.001$).

The factors related to the difficulty of seeking health information were extracted in order to assess individual capacity regarding health information-related variables (Table 4). The factors used to construct the information capacity index presented eigenvalues greater than 1 and factor loadings greater than 0.4. The first factor, accessing information, accounted for 44% of the total variance. This factor included four of the nine included variables: access to the Internet and a computer, and using a computer and an online search tool. A second factor, applying information, explained 26% of the total variance. This factor included five of the nine included variables: capacity to judge the accuracy, up-to-date, relevance, appropriate amount, and intelligibility of the information. These two factors were modeled as a continuous variable.

Multivariate analyses: Effect models of influential factors on SRH by health information-seeking/avoiding behaviors

The mediating difference between information seekers/avoiders was examined through the SIM model by determining the effects of the four types of direct/indirect factors impacting the SRH of cancer patients (Table 5). First, in terms of SDA factors, SRH was outstanding for subjects who are older ($B=0.347$, $p<0.05$) and non-

Hispanic White in the seeker group ($B=1.264$, $p<0.05$). In the information avoider group, the direction of the coefficient was negative but the effect was not statistically significant.

In terms of SES factors, both groups showed superior SRH for high educational level: $B=0.565$ in the information seeking group ($p<0.01$), and $B=0.388$ in the information avoidance group ($p<0.1$), despite the marginal significance.

For the cancer-related factors, which are confounding variables, statistical significance was shown only in the seeker group. In terms of cancer types, SRH was significantly bad for leukemia and blood cancer patients, compared to patients suffering other types of cancer ($B=-2.355$, $p<0.01$). Although only marginally significant, the following outcomes were interesting. SRH worsened as the illness period increased ($p<0.1$) and, in terms of health insurance type, compared to private insurance, SRH was worse when treatment was given through Medicaid/Medicare ($p<0.1$).

Lastly, we examined the effects of the health information-related factors on SRH with the confounding variables controlled for. For the seeker group, greater the capacity for applying information, the SRH was significantly high. The information avoiders exhibited a negative relationship between SRH and health information-related factors of both attitude toward helpfulness and capacity to apply information, despite the marginal significance ($p<0.1$). When the patients did not seek information but their families did, which is indicative of family support, SRH fared better compared to when

Table 3. Difference of Health Information-related Characteristics by Seeking/Avoiding Groups

Variables		Seeker (n=326)%	Avoider (n=176)%	χ^2 p value
Second Opinion	Yes	56.4	61.4	0.3
	No	43.6	38.6	n.s.
Family Support	Yes	73	75.9	0.5
	No	27	24.1	n.s.
Internet Trust	Completely trust	45.2	46.1	0.4
	Not trust	28.9	26.3	n.s.
	Don't know of Internet sites	25.8	27.5	
Information Confidence	High confident	58.5	50.6	9.5
	Medium confident	32.8	31.6	$p<0.01$
	Low confident	8.7	17.8	
Information Helpfulness	Strongly agree	46.6	26.4	17.2
	Somewhat agree	41.7	52.9	$p<0.001$
	Somewhat disagree	7.9	15	
	Strongly disagree	3.8	5.7	

*n.s.- not significant

Table 4. Principal Components Analyses: Factor loadings for Barriers to Cancer-Related Information Seeking Behaviors

"People sometimes have a difficult time finding the information that they are looking for. Please tell us whether each of the following issues was a large problem, a small problem, or no problem at all in finding or getting the information you wanted about your cancer." (Cronbach's alpha=0.932)	Factors	
	Access	Utilization
I did not have enough access to the Internet	0.928	
I did not have enough access to a computer	0.92	
Difficulties in using a computer	0.867	
Difficulties using an on-line search tool or software	0.86	
There was no way to tell if information was accurate		0.876
There was no way to tell if information was up-to-date		0.855
There was no way to tell if information was relevant to my situation		0.804
There was too much information		0.682
The available information used too many technical terms		0.584

Note: Factor loadings for a promax oblique rotation

*Components with eigen values <1 were excluded and factor loadings <0.4 are not shown.

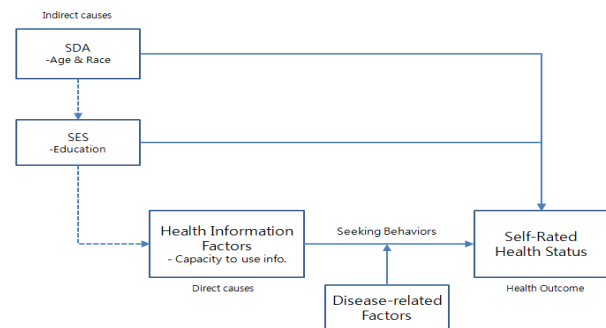


Figure 2. Health Information Seeking Behavior (HISB) Model of this Study. *The dotted lines are based on related theories; the unbroken lines indicate the results of this study

Table 5. Ordered Logistic Regression Analyses: Effect Models of Influential Factors on Self-Rated Health Status by Information-Seeking/Avoiding Behaviors

Factors	Variables	Information-Seeker			Information-Avoider		
		B	S.E.	p-value	B	S.E.	p-value
Sociodemographic Factors							
Gender	Men (Ref.)						
	Women	-0.454	0.393		0.446	0.627	
Age		0.347	0.161	p<0.05	-0.082	0.217	
Race	Non-Hispanic White	1.264	0.587	p<0.05	-0.771	0.729	
	Hispanic	1.859	1.277				
	Black/African American	0.227	0.709				
	Other (Ref.)						
Socioeconomic Factors							
Education		0.565	0.182	p<0.01	0.388	0.216	p<0.1
Income		0.044	0.175		0.402	0.256	
Debt		0.036	0.105		0.156	0.145	
Cancer-related Factors							
Cancer Type	Breast Cancer	0.662	0.43		0.061	0.524	
	Colon or Rectal Cancer	-0.447	0.671				
	Leukemia or Blood Cancer	-2.355	0.799	p<0.01			
	Lung Cancer	0.128	0.704				
	Other (Ref.)						
Length of Illness		-0.252	0.147	p<0.1	-0.03	0.198	
Health Insurance	Private insurance (Ref.)						
	Medicaid/Medicare	-0.912	0.505	p<0.1	-0.406	0.79	
Health Information-related Factors							
Second Opinion		0.287	0.346		0.051	0.42	
Family Support		0.621	0.433		1.077	0.586	p<0.1
Internet Trust		-0.188	0.224		0.087	0.281	
Attitude toward Information	Be Confident	-0.032	0.247		0.198	0.248	
	Be Helpful	-0.131	0.275		-0.554	0.326	p<0.1
	Access Capacity	-0.114	0.168		0.349	0.27	
Information Capacity	Utilization Capacity	0.58	0.186	p<0.01	-0.387	0.206	p<0.1
Fit Statistics							
	-2LL	247.619			160.575		
	X ²	50.112			35.659		
	P-value	p<0.001			p<0.01		
	Nagerlkerke R2	0.346			0.389		

*Dependent Variable: Self-rated Health (SRH) Status, 3-point Likert Scale

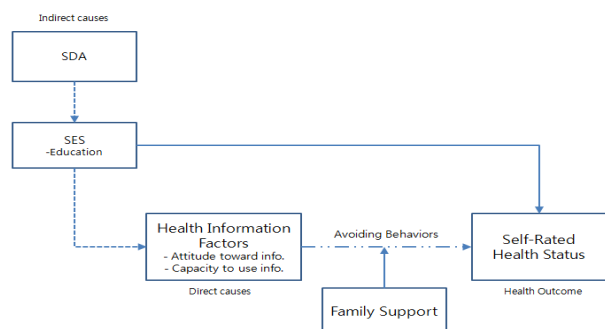


Figure 3. Health Information Avoidance Behavior (HIAB) Model of this Study.*The dotted lines are based on related theories; the unbroken lines indicate the results of this study. The mixed line represents a pathway of the discordance between the theory and the model

there was no such support (p<0.1).

Discussion

HISBs are known to exert positive effects on various health outcomes (Czaja et al., 2003; Shi et al., 2004; Rutten et al., 2005; 2006). However, few studies have been done to clarify specific factors in such seeking behaviors and their difference with avoiding ones. This study showed several important clues about the presumed features of information avoiders compared with information seekers, and this issue therefore needs to be analyzed

through reconfiguration of the SIM framework. First of all, despite the absence of any significant difference in health status, the above two groups showed distinct associations between social class and SRH under the SIM model depending on HISBs.

The HISB model revealed that four factors are altogether connected with SRH (Figure 2). SRH was predicted to stay favorable among those highly educated white women with good SES plus higher individual capacity for utilization of health information (p<0.05). Under the SIM framework, this study verified not only the socioeconomic context but also the empirical meaning of health information-related attitude and capacity that have so far been neglected in explanations of information seeking behaviors. Consequently, individual capacity for information utilization is a factor with direct effects on information seeking.

Compared with the HISB model, the HIAB model exhibited a distinct explanatory mechanism rather than an opposite pattern (Figure 3). Compared with information seekers, this group represented relatively young women with poor financial status, and they didn't show conspicuous associations between socioeconomic backgrounds and SRH. Notably, those with higher education levels recorded a marginally favorable level of SRH (p<0.1), but weren't linked with individual disease characteristics. Rather, they had high associations with health information factors. Contrary to our expectation

about information seeking behaviors, the information avoider group didn't reveal a significantly high level of SRH in case of excellent attitude and capacity, but exhibited a reverse correlation ($p < 0.1$).

It cannot be concluded that information avoiding behaviors themselves logically predict the SRH level simply because information avoiders have overall low capacity and negative attitude towards information seeking compared with information seekers. In other words, although information seeking directly contributes to raising the SRH level, information avoidance may not directly lower the SRH level. Numerous other factors existed in the SRH level of information avoiders. For instance, they might eventually learn of the information through their family despite their information avoidance. Likewise, a marginally positive relationship existed between information avoiders and SRH, in the case of family support ($p < 0.1$). For all their information avoidance, they seemed to undergo the same effect as information seeking.

According to the study findings, information seeking clearly manifested effects on SRH improvements. Compared with the avoider case, the seeking behavior model showed a reasonable explanatory mechanism between social class, seeking behavior, and SRH. This has crucial implications in that information seeking lays the foundation for overcoming health inequalities based on social class. In other words, the pursuit of communication equity can offer some room to offset or mitigate the negative consequences of social inequalities.

By contrast, information avoiding behaviors didn't display a consistent explanatory mechanism. In examining the close links between information avoiders and social class, many scholars have predicted that information avoidance consistently prevails in the lower social class (Ramanadhan and Viswanath, 2006; Rutten et al., 2006; Ishikawa et al., 2012; Wang et al., 2013). However, this should be supported by significant associations between socioeconomic backgrounds and SRH in the avoider group. Empirical evidence of this study, however, reveals that SRH is associated with health information factors rather than social class, and that the direction of the relationship runs contrary to the previous research predictions. Presumably, information avoidance is a temporary and inconsistent behavior due to disease phobia. Overall, information seeking is boosted under the structural condition of SES/SDA, and information avoidance is manifested by individual characteristics. Regarding study limitations, as part of a cross-sectional study, this study has examined the causal relationships among variables by existing theories. These causal relationships should be further verified and generalized based on massive longitudinal data on diverse chronic diseases.

Health information is gradually gaining attention due to unmet health needs and the rising expectations for better prognosis and health recovery through informed decision making (Rimer et al., 2004). Nevertheless, little research has focused on the gap between the information seeking and information avoiding groups. Our findings

showed a difference in communication inequality between seeking behaviors and avoiding behaviors. The former was attributable to the structural condition with close ties to SES, whereas the latter represented individual avoidance. Therefore, the health needs of information avoiders will be satisfied by assisting them with their capacity building and positive attitude toward information seeking. Moreover, policies and institutions should be put in place for the seeker group to reduce communication inequalities caused by social class and disease type.

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